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TECHNOLOGIES
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ETH-4X1 / 2X1 (MANUAL ETHERNET SWITCH)

INSTALLATION / USER GUIDE

MAN023 Rev Date 6/28/2002

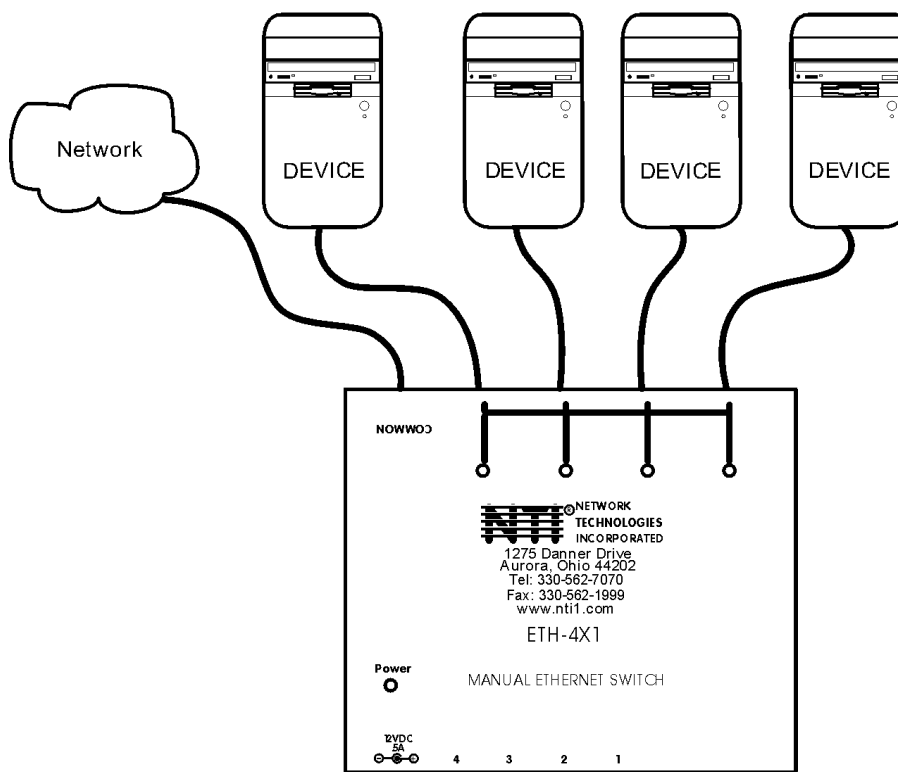
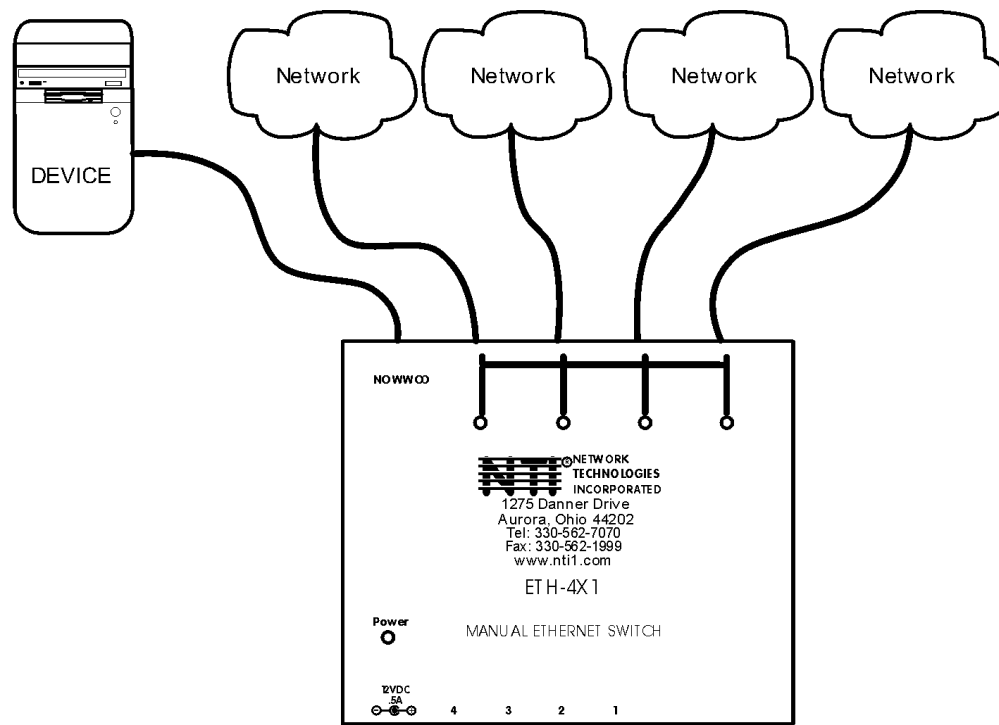


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Introduction

The NTI ETH-4X1 / ETH-2X1 Manual Ethernet Switch was designed to enable the connection of one of four DEVICES to one NETWORK or one DEVICE to one of four separate NETWORKs using standard ethernet cable. The user can control the ETH-4X1 / ETH-2X1 manually to make a single connection active between one NETWORK and one DEVICE at a time.

Available Options

- Manual Ethernet Switch with 2 user selectable connection ports rather than 4 (ETH-2X1)
- RS232 control to change connections in the ETH-4X1-RS switch via a serial stream (ETH-4X1-RS or ETH-2X1-RS)

Glossary

NETWORK- Local Area Network (LAN)* , File server, DSL internet connection

CPU- Computer for user access

DEVICE- CPU or other data entry/acquisition equipment

COMMON- A DEVICE or NETWORK that is to be commonly connected to the selected NETWORKSs or DEVICESs (up to 4) through the ETH-4X1 Manual Ethernet Switch

SELECTABLE- Any of the NETWORKs or DEVICES (up to 4) that will be plugged into the user selectable ports (1-4) and connected to the COMMON through the ETH-4X1 Manual Ethernet Switch

***Note:** The ETH-4X1 Manual Ethernet Switch cannot differentiate between LANs and modems. For the purposes of this manual they will be considered to be identical.

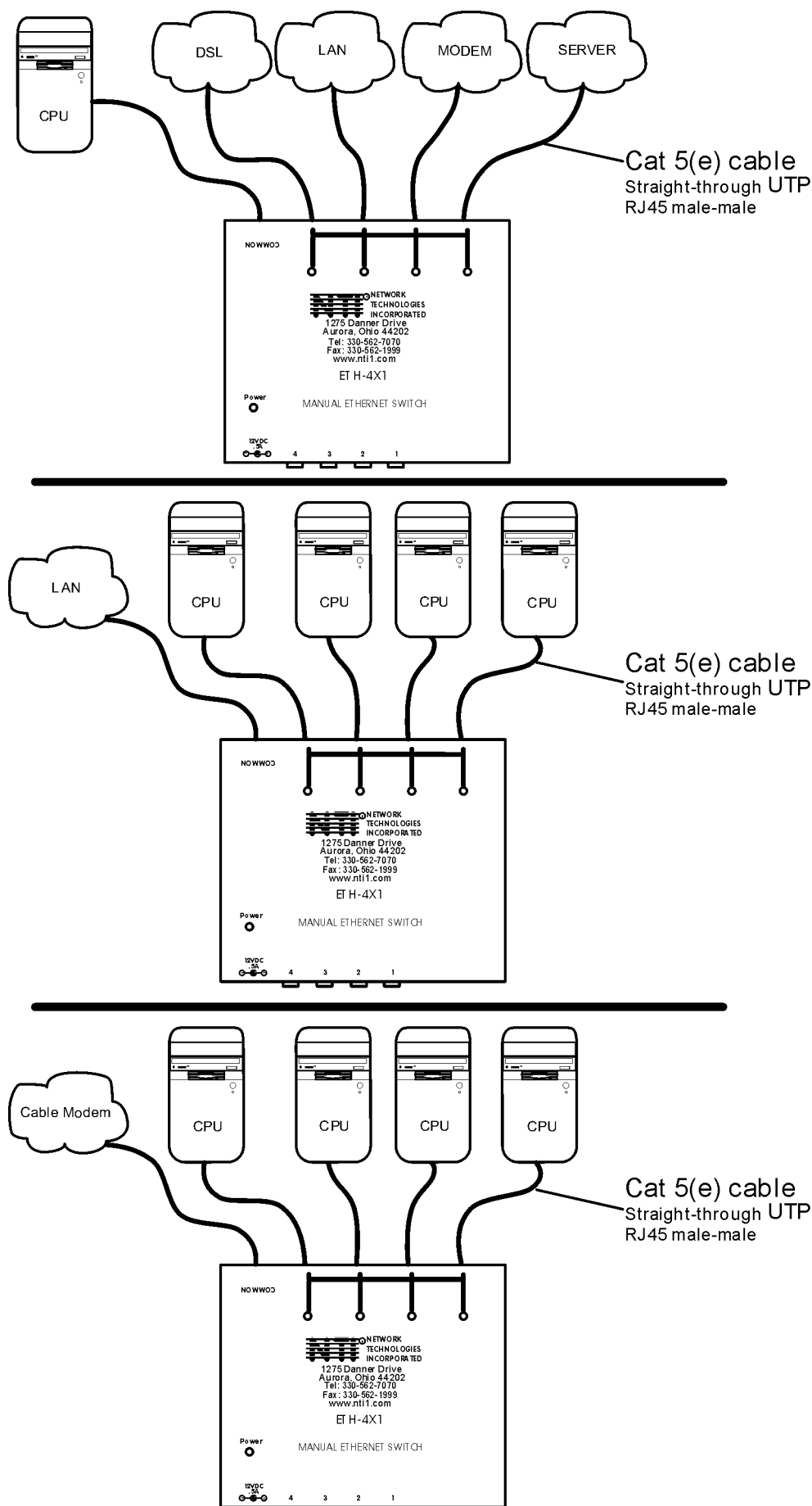
Limitations

All SELECTABLEs must be of the same type (All NETWORKs or all DEVICES)

If a DEVICE is connected to the "COMMON" port, then only NETWORKs may be connected to the user selectable ports.

If a NETWORK is connected to the "COMMON" port, then only DEVICES may be connected to the user selectable ports.

Application Examples



Materials

Materials Supplied with this kit:

- NTI ETH-4X1 / ETH-2X1 Manual Ethernet Switch
- 120VAC or 240VAC -12VDC/.5A AC Adapter
- This owner's manual

Materials Not Supplied, BUT REQUIRED:

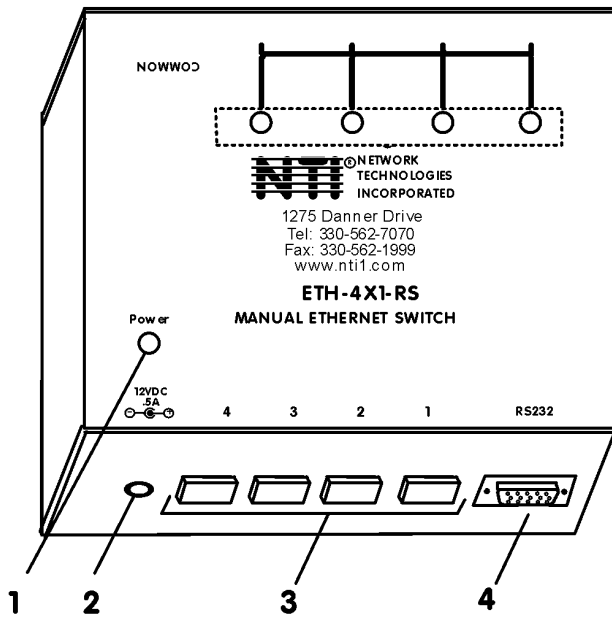
- Ethernet Cables- Cat5(e)UTP straight-through with male-male connectors

Preparation for Installation

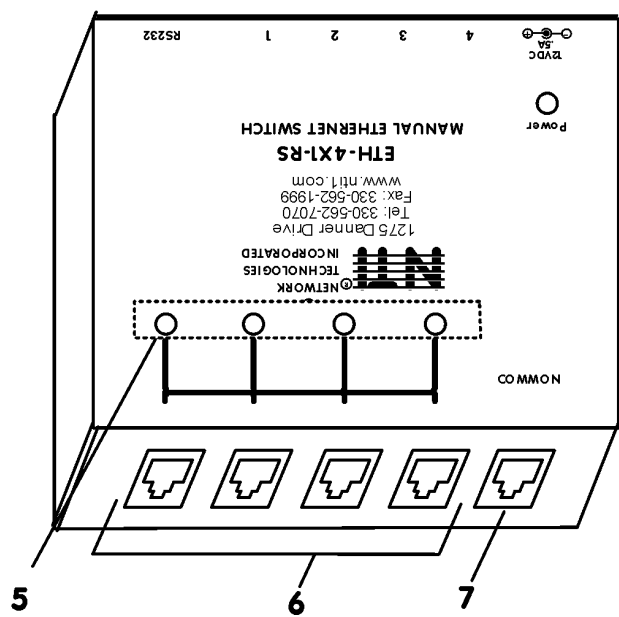
- A location should be chosen for the ETH-4X1 such that the ethernet cable from each supported device will reach it.
- The ethernet cables must be run to the locations where the ETH-4X1 switch, COMMON, and the SELECTABLE(s) will be mounted. Be careful to route the cables away from any sources of magnetic fields or electrical interference that might reduce the quality of the signal (i.e. AC motors, welding equipment, etc.).
- A 120V or 240V electrical outlet (depending on the AC adapter being used) must be available close enough to the mounting location of the ETH-4X1 to plug the AC adapter into.
- All cables should be installed in such a way that they do not cause stress on their connections to the equipment. Extended lengths of cable hanging from a connection may interfere with the quality of that connection. Secure cables as needed to minimize this.
- Properly shut down and disconnect the power from the DEVICE(s) and/or NETWORK(s) to be connected. If other equipment is involved whose connections are being interrupted, be sure to refer to the instruction manuals for that equipment for proper disconnection and re-connection procedures before proceeding.

FEATURES AND FUNCTIONS

Front View of ETH-4X1-RS



Rear View of ETH-4X1-RS

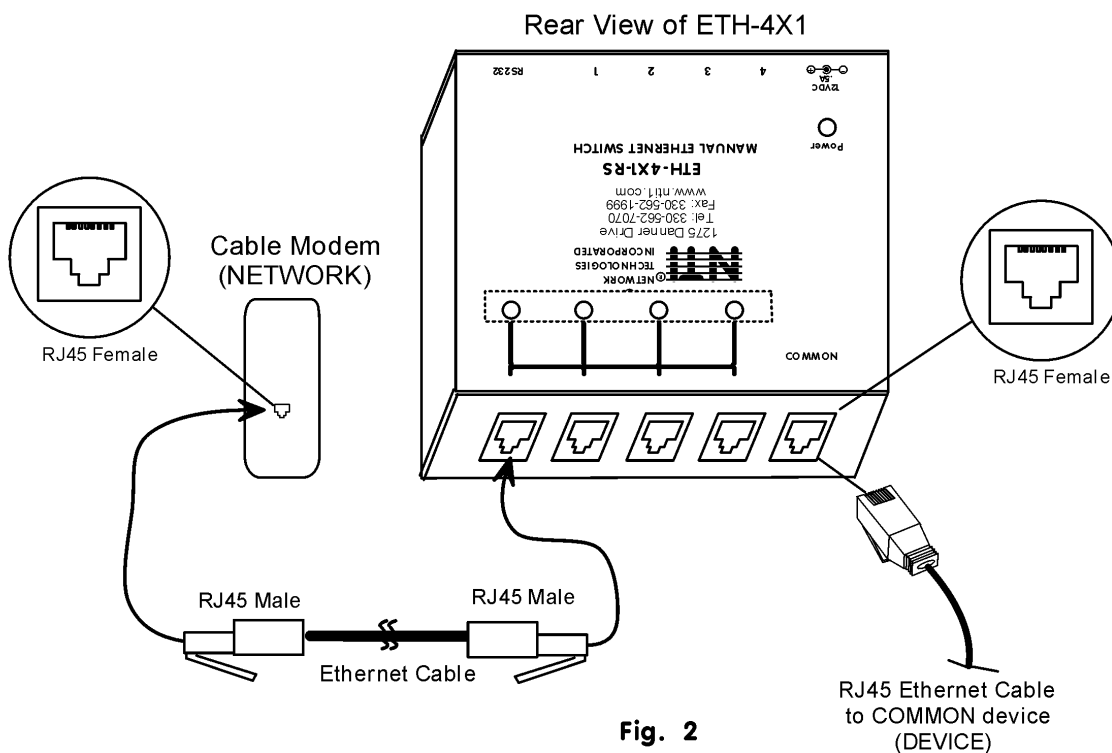
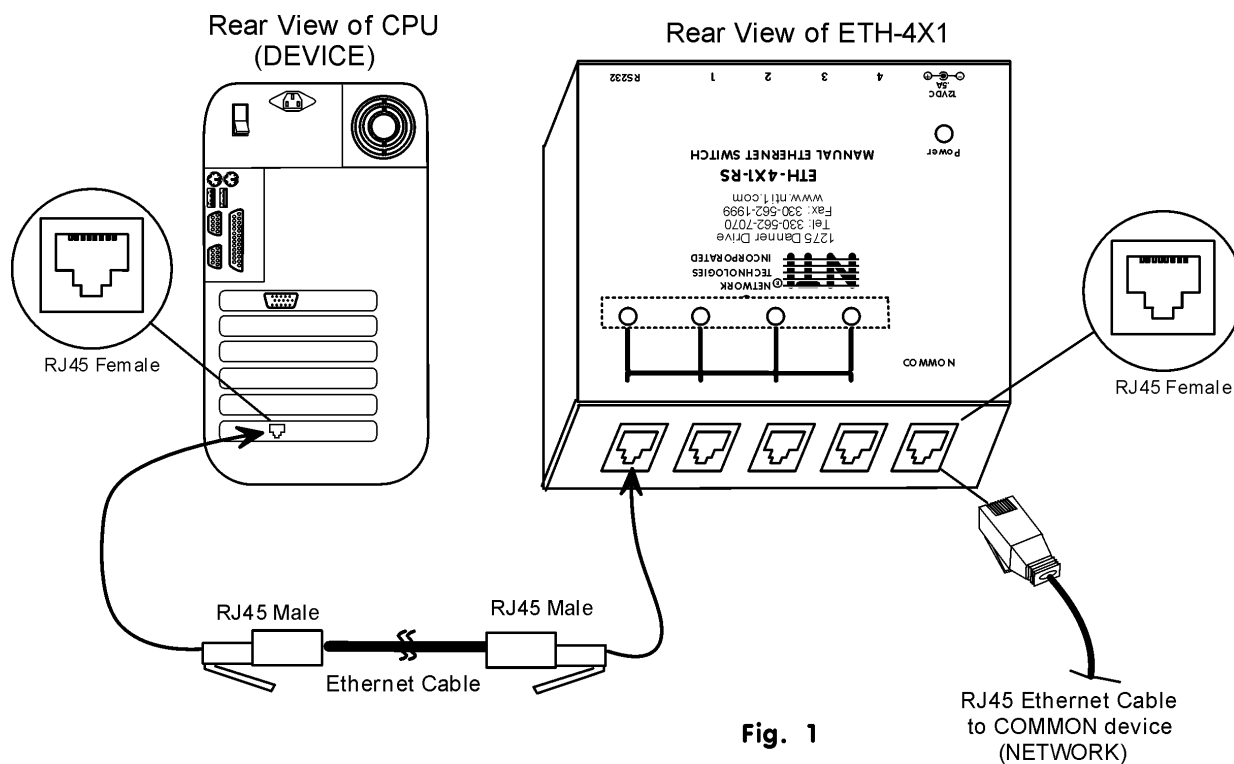


Features and Functions

1. Power- LED to indicate the ETH-4X1 Manual Ethernet Switch has power to operate
2. 12VDC .5A- female connection jack for the AC adapter
3. Select Switches- (1-4)- for manual control of "COMMON" and user selectable ports (1-4)
4. RS232- 9 pin DIN male (optional)- for computer control of "COMMON" and user selectable ports (1-4)
5. Status LEDs- for visual indication of switch connection between the "COMMON" and the user selectable ports (1-4)
6. User Selectable Ports (1-4)- RJ45 female- for connection of SELECTABLEs
7. COMMON port- RJ45 female- for connection of COMMON

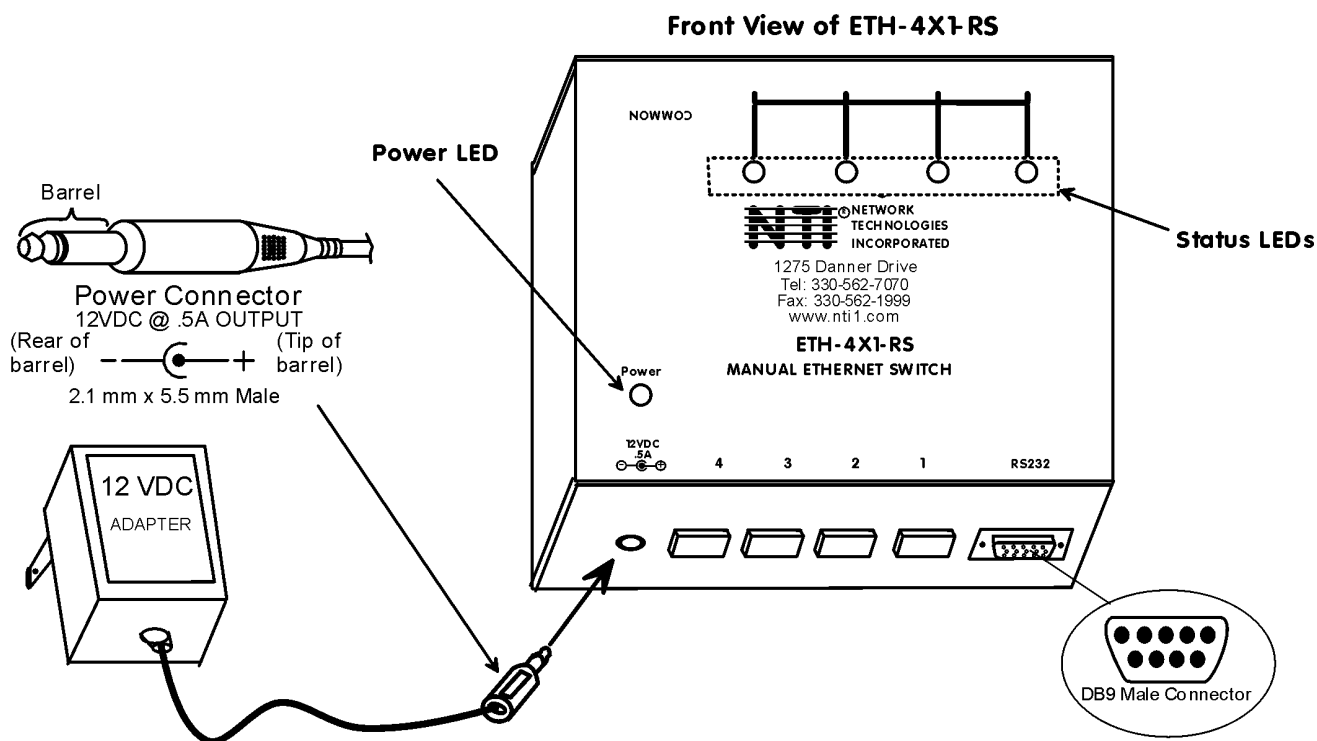
Installation

1. Position the ETH-4X1 Manual Ethernet Switch such that the ethernet cable from the COMMON , the AC adapter power cable, and the ethernet cables from the SELECTABLEs can reach the ETH-4X1 Manual Ethernet Switch.
2. Connect one end of an ethernet cable to the COMMON (See Fig.1.) Connect the other end of that cable to the "COMMON" port on the ETH-4X1 Manual Ethernet Switch.
3. Connect another ethernet cable between each SELECTABLE and the user selectable ports (1-4) on the ETH-4X1 Manual Ethernet Switch. (See Figs.1 and 2.)



Plug-in and Boot Up

1. Connect the AC adapter power connector to the 12VDC port on the ETH-4X1 Manual Ethernet Switch. Make sure the power connector is properly inserted. (See Fig. 3.)
2. Plug the AC adapter into a power outlet. The "Power" LED on the ETH-4X1 Manual Ethernet Switch should illuminate indicating that a proper power connection has been made. Status LED "1" should also illuminate indicating a connection between the "COMMON" port and user selectable port 1.



3. Power up the COMMON and SELECTABLE device(s). The COMMON device should react as if it were directly connected to the SELECTABLE device plugged into user selectable port 1.

RS232

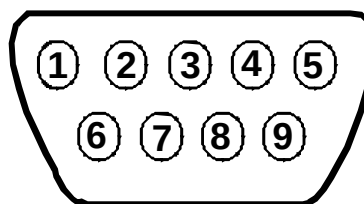
To use the RS232 port (optional), connect a crossed female serial cable from a CPU serial port to the DB9 pin male RS232 port on the ETH-4X1-RS Manual Ethernet Switch. Connections are as follows:

Connector: Standard 9 pin serial, male

Pins at ETH-4x1-RS	Signal	Pins at CPU
2	RxD	3
3	TxD	2
5	GND	5

RS-232 setup parameters:

- 9600 baud
- 8 bit data
- 1 stop bit
- no parity
- no flow control



Mating Face of Male DB9

Any terminal program can be used to control the switch, if that program supports the given parameters (example HyperTerminal in Windows, Norton Commander terminal in DOS). An available standard serial port is needed.
Accepted commands:

Keystroke	Action
1	Switch to port 1
2	Switch to port 2
3	Switch to port 3 (ETH-4x1-RS only)
4	Switch to port 4 (ETH-4x1-RS only)
0	Disconnect all
D	Deactivate buttons
B	Activate buttons (power-ON defaults)

All other characters will be ignored.

All correctly received characters will be echoed (repeated back to user's monitor)

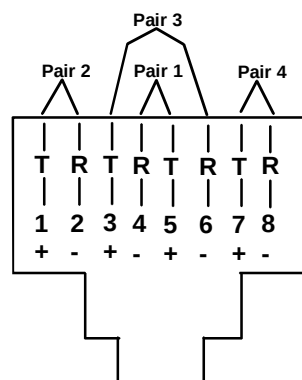
Technical Specifications

Interconnect Cable	CAT5(e) UTP Ethernet straight-through (not crossed)
Power	120 or 240 VAC 12VDC / 5A AC Adapter (provided)
ETH-4X1 current draw	< 0.2A @ 12VDC

Interconnection Cable Wiring Method

The CAT5(e)UTP connection cable between the COMMON, SELECTABLE(s) and the ETH-4X1 Manual Ethernet Switch is terminated with male ethernet connectors and must be wired according to the EIA /TIA 568A industry standard. Wiring is as per the table and drawing below.

Pin #	Wire Color	Function
1	White/Orange	T
2	Orange	R
3	White/Green	T
4	Blue	R
5	White/Blue	T
6	Green	R
7	White/Brown	T
8	Brown	R



(View Looking into RJ45 female)

Troubleshooting

Each and every piece of every product produced by Network Technologies Inc is 100% tested to exacting specifications. We make every effort to insure trouble-free installation and operation of our products. If problems are encountered while installing this product, please look over the troubleshooting chart below. If an answer is not found in the chart, check the FAQs (Frequently Asked Questions) at our website at <http://www.nti1.com> or contact NTI directly for help at 800-742-8324 (800-RGB-TECH) in US & Canada or 330-562-7070 (worldwide). We will be happy to assist in any way we can.

Problem	Cause	Solution
ETH-4X1 power LED does not illuminate	Power supply is not connected or plugged-in.	Make sure outlet is live and AC adapter is plugged in. Also make sure power jack is fully connected to the switch.
NETWORKS(s) will not communicate with DEVICE(s)	- Poor Connection - Wrong ethernet cable	- Make sure all ethernet cables are inserted completely, snapping into RJ45 sockets - Cable must be CAT 5 ethernet- straight through type, NOT crossed

If the answer to a question is not in the troubleshooting chart or on the NTI website and a call to NTI is required, please have the following information available at the time of the call:

- NTI model number (from the top) and serial number (from the bottom) of the switch.
M/N _____ S/N _____
- The total length of the ethernet cables in use. _____
- Computer Information:
 - Manufacturer _____
 - Model _____
 - Ram _____
 - BIOS Mfr. _____
 - BIOS Revision _____
 - Operating System _____
- Make and model number of any modems connected to the switch.

Warranty Information

The warranty period on this product (parts and labor) is one (1) year from the date of purchase. Please contact Network Technologies Inc at (800) 742-8324 (800-RGB-TECH) or (330) 562-7070 for information regarding repairs and/or returns. A return authorization number is required for all repairs/returns.

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Changes

The material in this guide is for information only and is subject to change without notice. Network Technologies Inc reserves the right to make changes in the product design without reservation and without notification to its users.

MODEL : ☐ **ETH-4X1**
 ☐ **ETH-2X1**
 ☐ **ETH-4X1-RS**
 ☐ **ETH-2X1-RS**

SERIAL NO: _____

DATE: _____

INSPECTED BY: _____